

PROTECTION REVIEW

PERKINS —
EASTMAN

Human by Design

WASHINGTON HARBOUR



DUE DILIGENCE

NUISSANCE PROTECTION

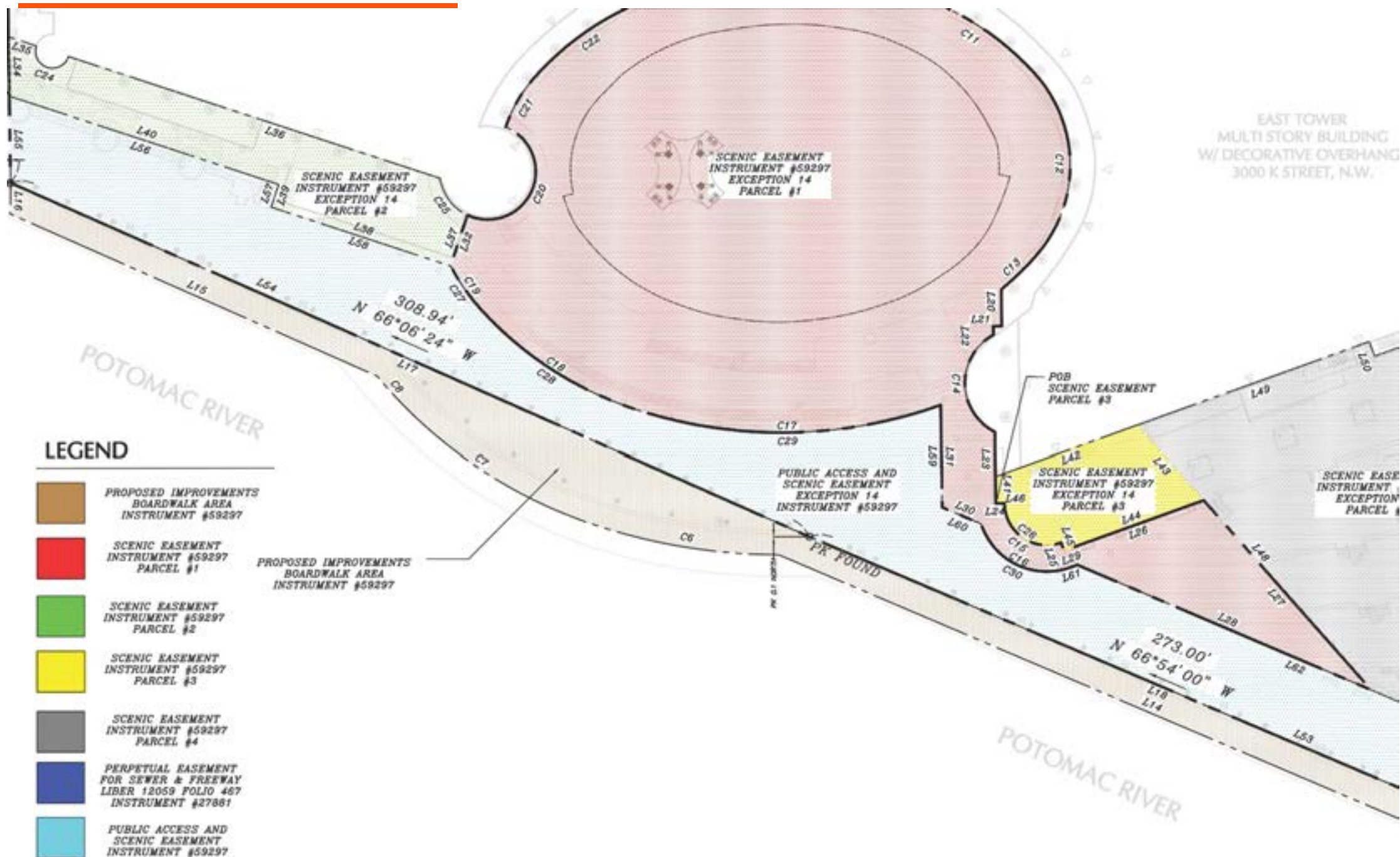
Low flood wall along property line to mitigate nuisance flooding



RECOMMENDATION:
30" WALL REDUCES POTENTIAL ANNUAL
GATE RAISING EVENTS FROM 5 TO 2*

		Flood events in last 9 years	1 Foot Wall EL. 4.9'	2 Foot Wall EL. 5.9'	2.45' Foot Wall EL. 6.36'	3 Foot Wall EL. 6.9'	4 Foot Wall EL. 7.9'
Water Elevations	10.0	0	0	0	0	0	0
	9.0	1	1	1	1	1	1
	8.0	2	2	2	2	2	2
	7.0	6	6	6	6	6	0.6
	6.0	10	10	10	6.40	1	
	5.0	25	25	2.5			
	4.0	114	11.4				
Total High Water Events per year:		158	44	21.5	15.4	10	3.6
Average High Water Events per year:		17.56	4.89	2.39	1.71	1.11	0.40
Gate Raising Events per Year:		4.89	4.89	2.39	1.71	1.11	0.40
Percent Reduction of Gate Raising Events:			0.00%	51.14%	65.00%	77.27%	91.82%

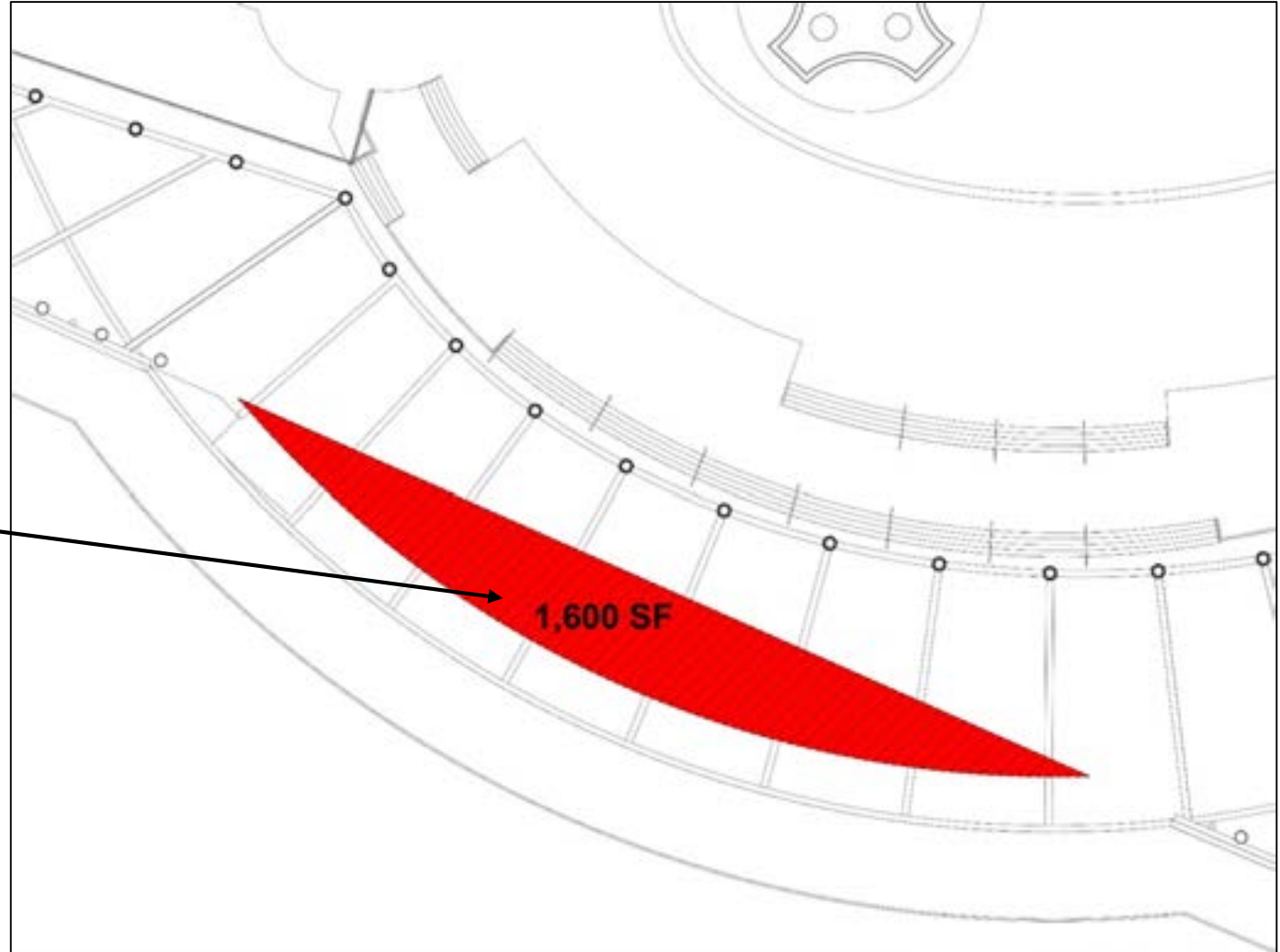
* NO FREEBOARD
CASE BY CASE JUDGEMENT



AREA LIMITATION

1,600 SF ON SITE

1,600 SF IS PERMITTED BEYOND THE
PROPERTY LINE PER EASEMENT.



WALL INTEGRATION

WALL OPTIONS

Design goals –

- Minimize impact on views of the river
- Enhance the pedestrian experience along the waterfront
- Provide multiple points of access to the boardwalk- not just at each end
- Accessible by all
- Materiality to complement Washington Harbour
- Code compliant but eliminate railings
- Minimize vagrancy options



BOARDWALK EDGE



BENCHES W/ ALUMINUM PLANKS



STRAMP



CIVIC ART

CIVIC ART – BARCELONA STREET LIGHT BENCHES



CIVIC ART – HAVANA - MALECON



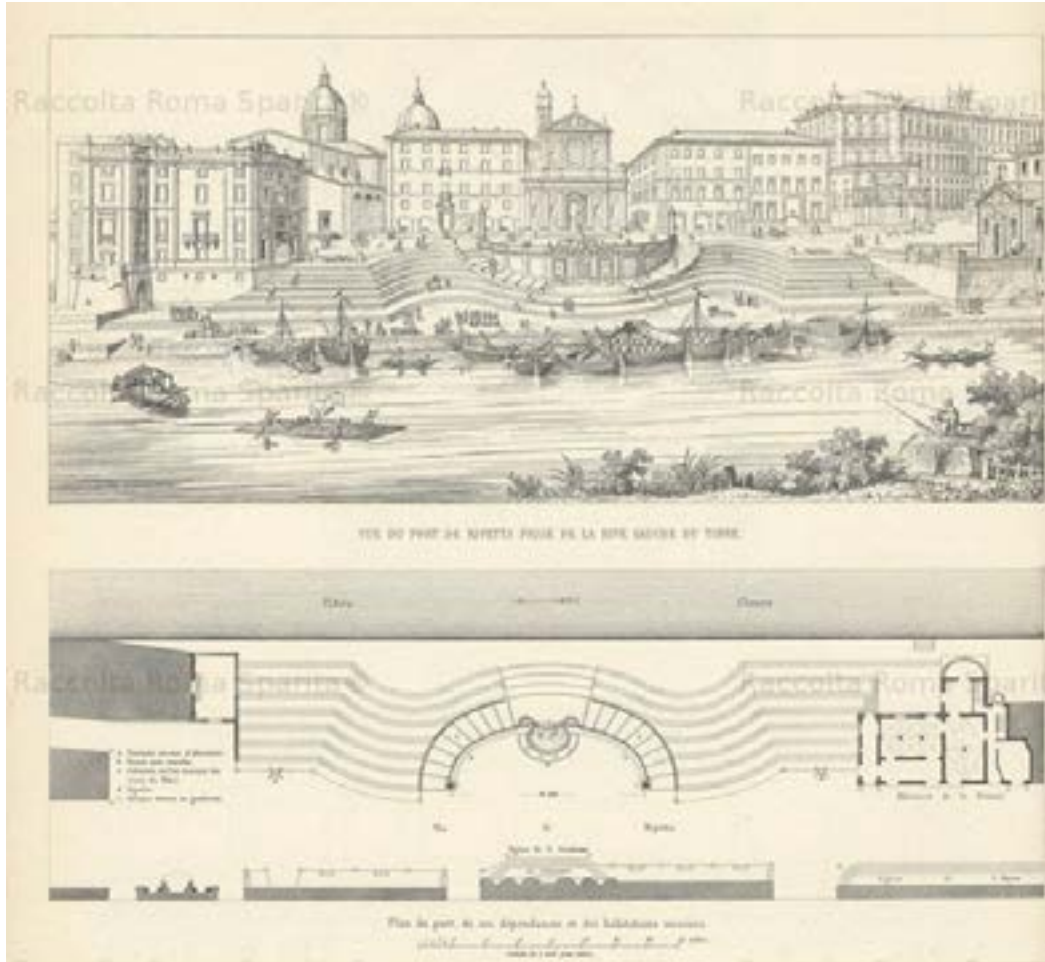
CIVIC ART – PHILADELPHIA WATERWORKS



CIVIC ART – AHILYA GHAT, VARANASI



CIVIC ART - PORTO DI RIPETTA, ROME





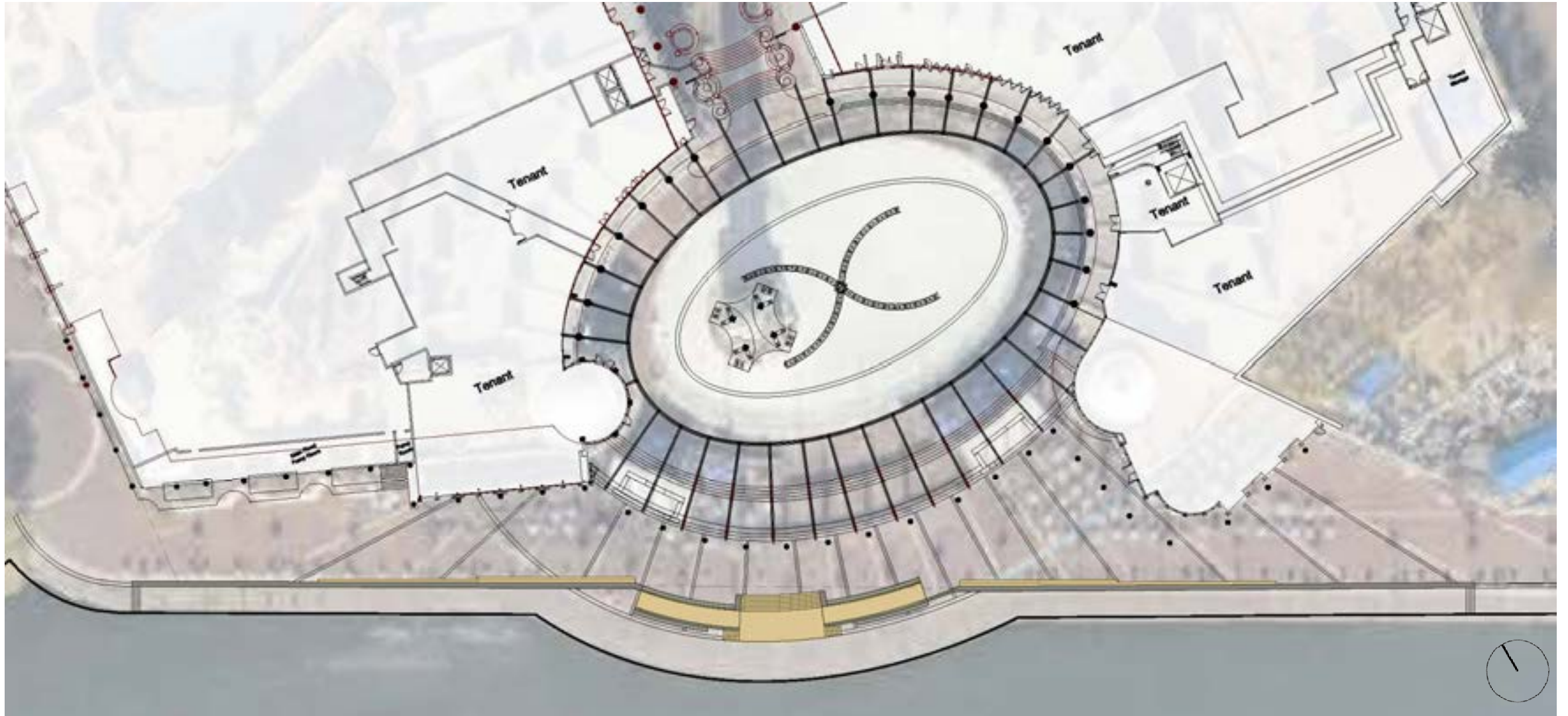
PROPOSED DESIGN

EXISTING SITE

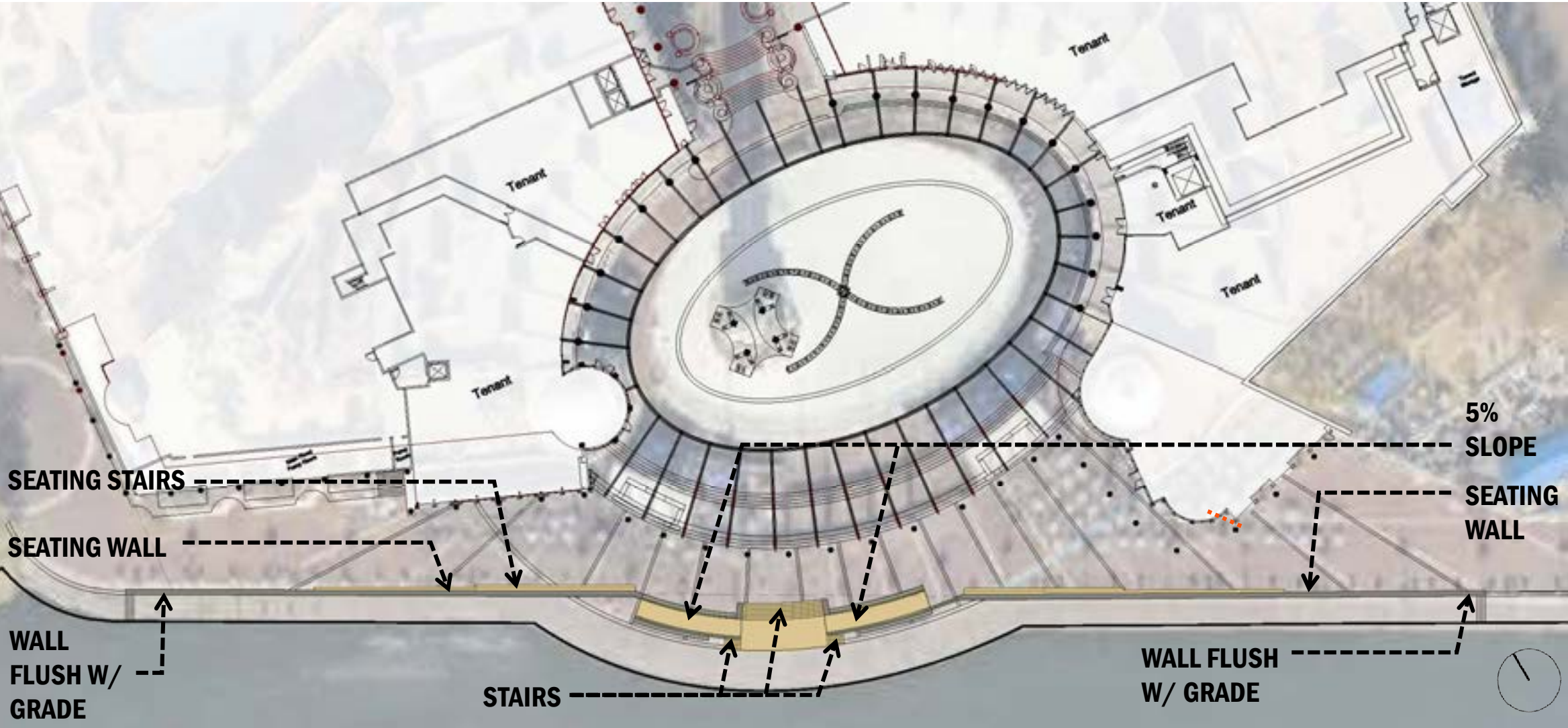
SITE PLAN DIAGRAM



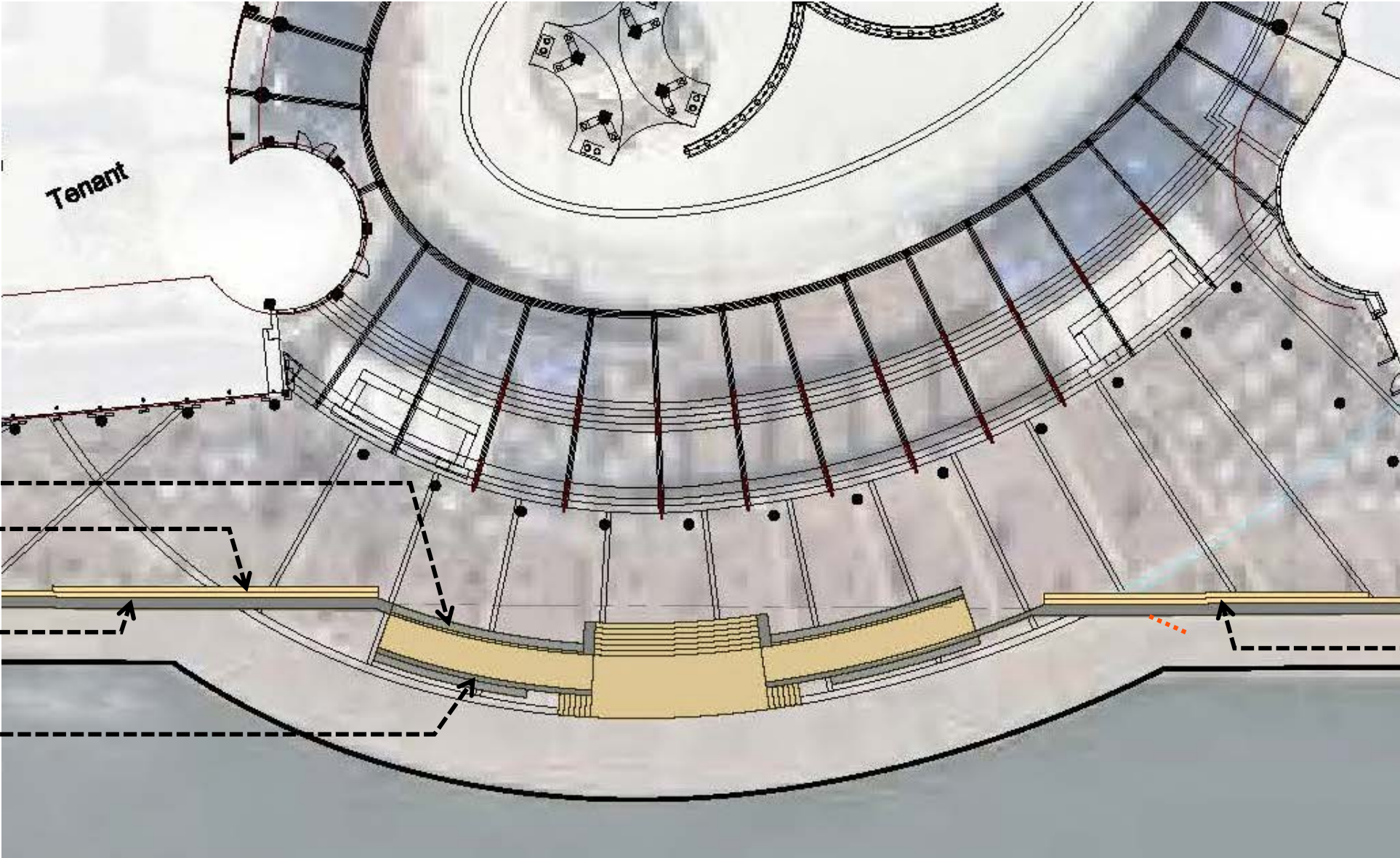
BULKHEAD EDGE



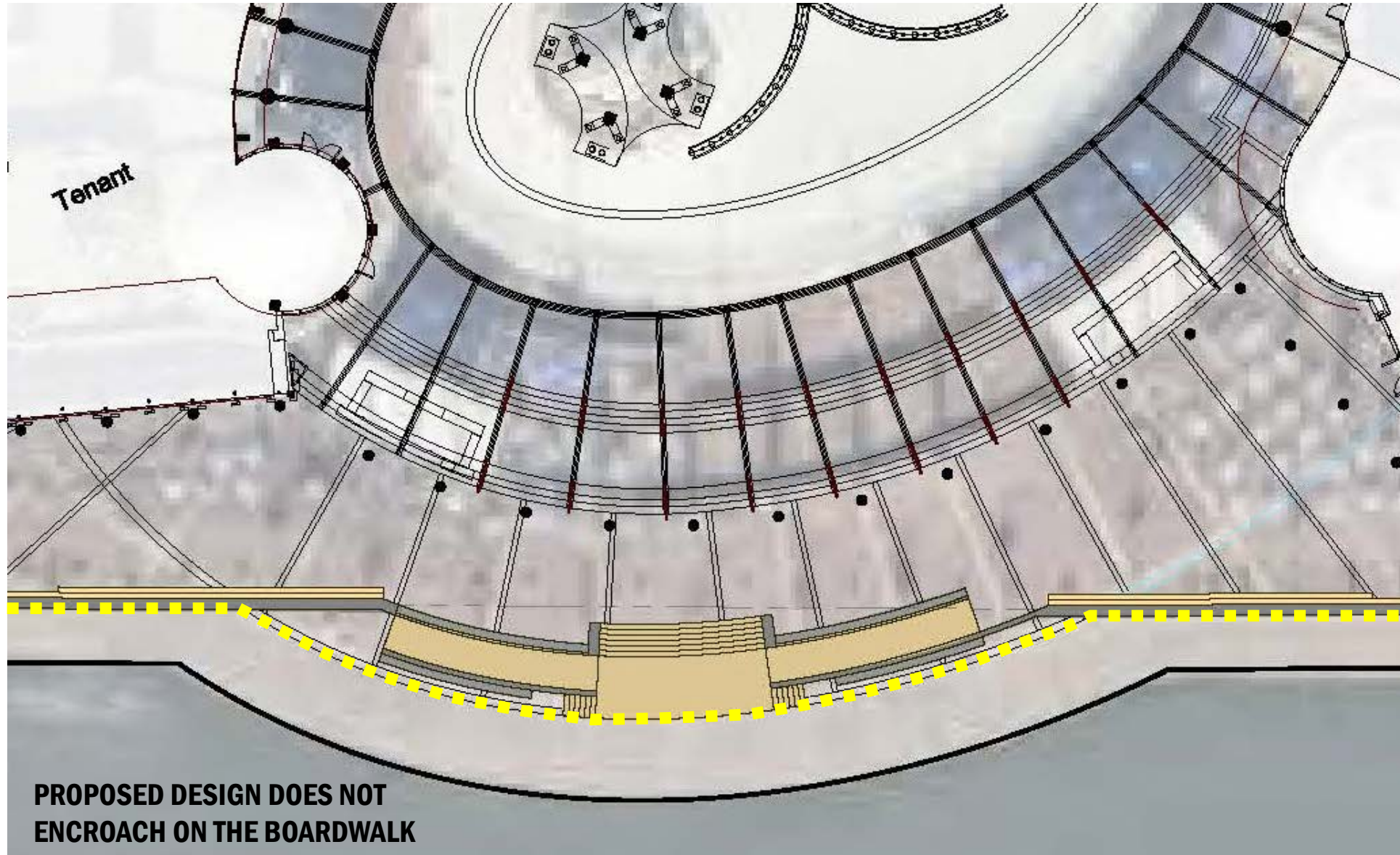
BULKHEAD EDGE



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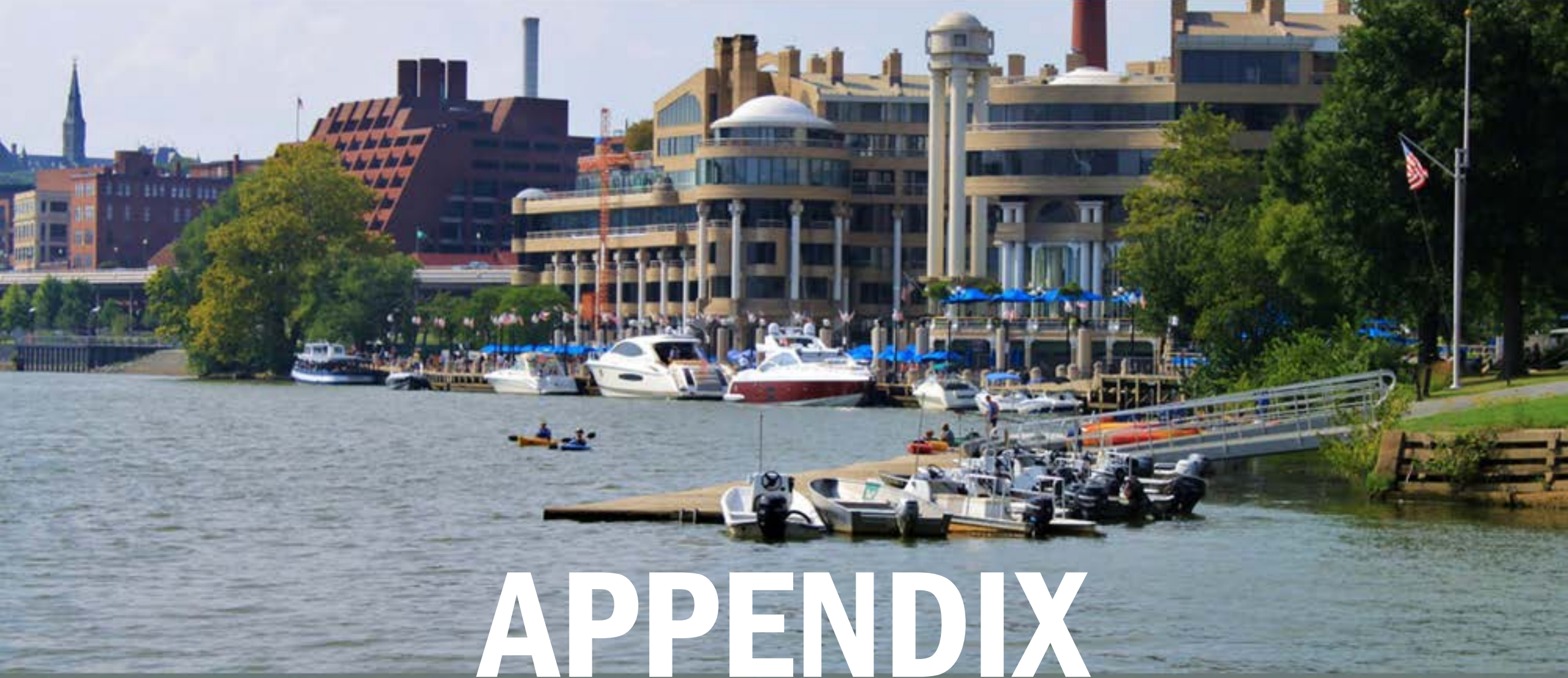




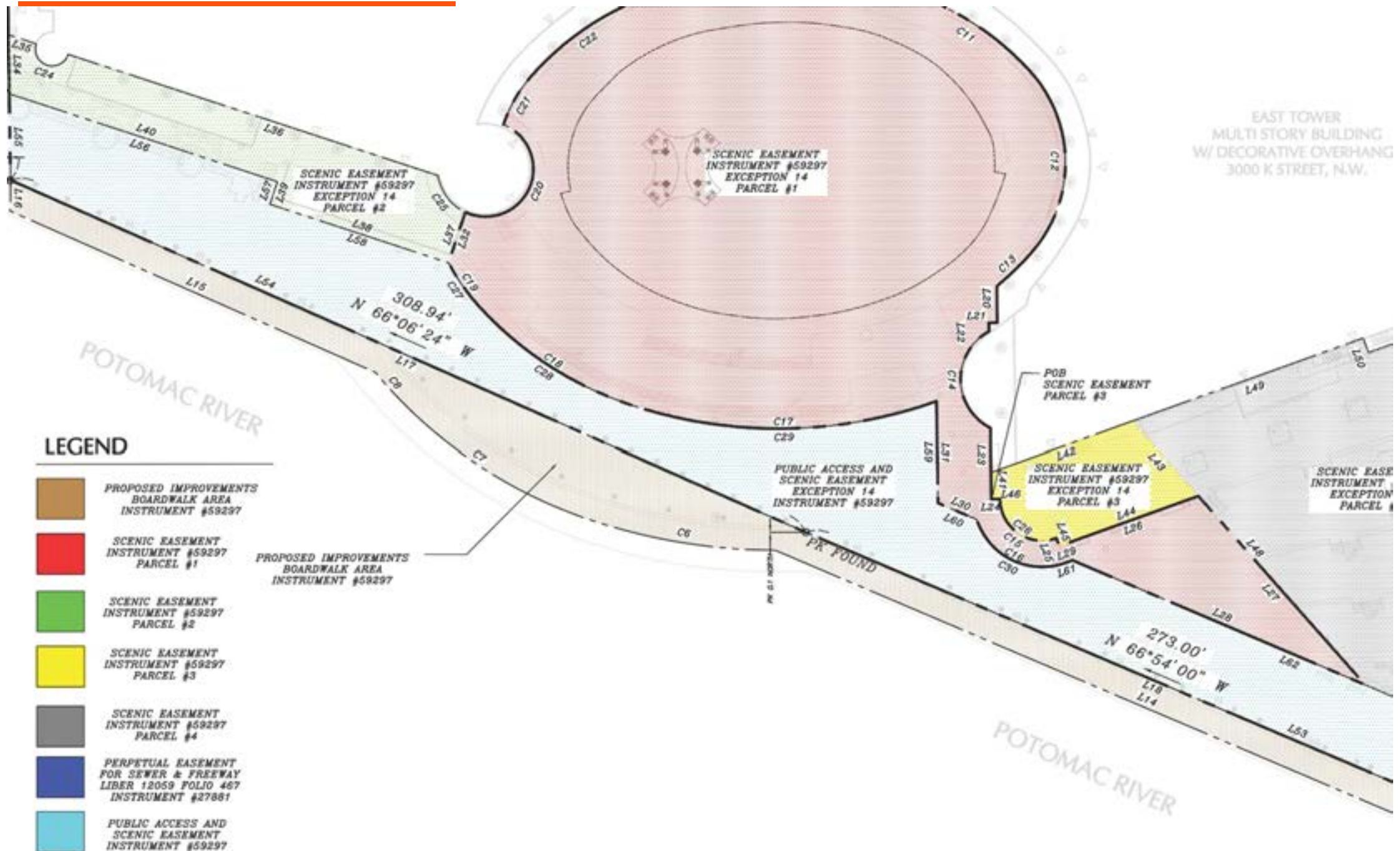
**3'-0" WALL
AT MIDPOINT**

**3'-0" WALL
AT MIDPOINT**





APPENDIX



FLOOD STUDY

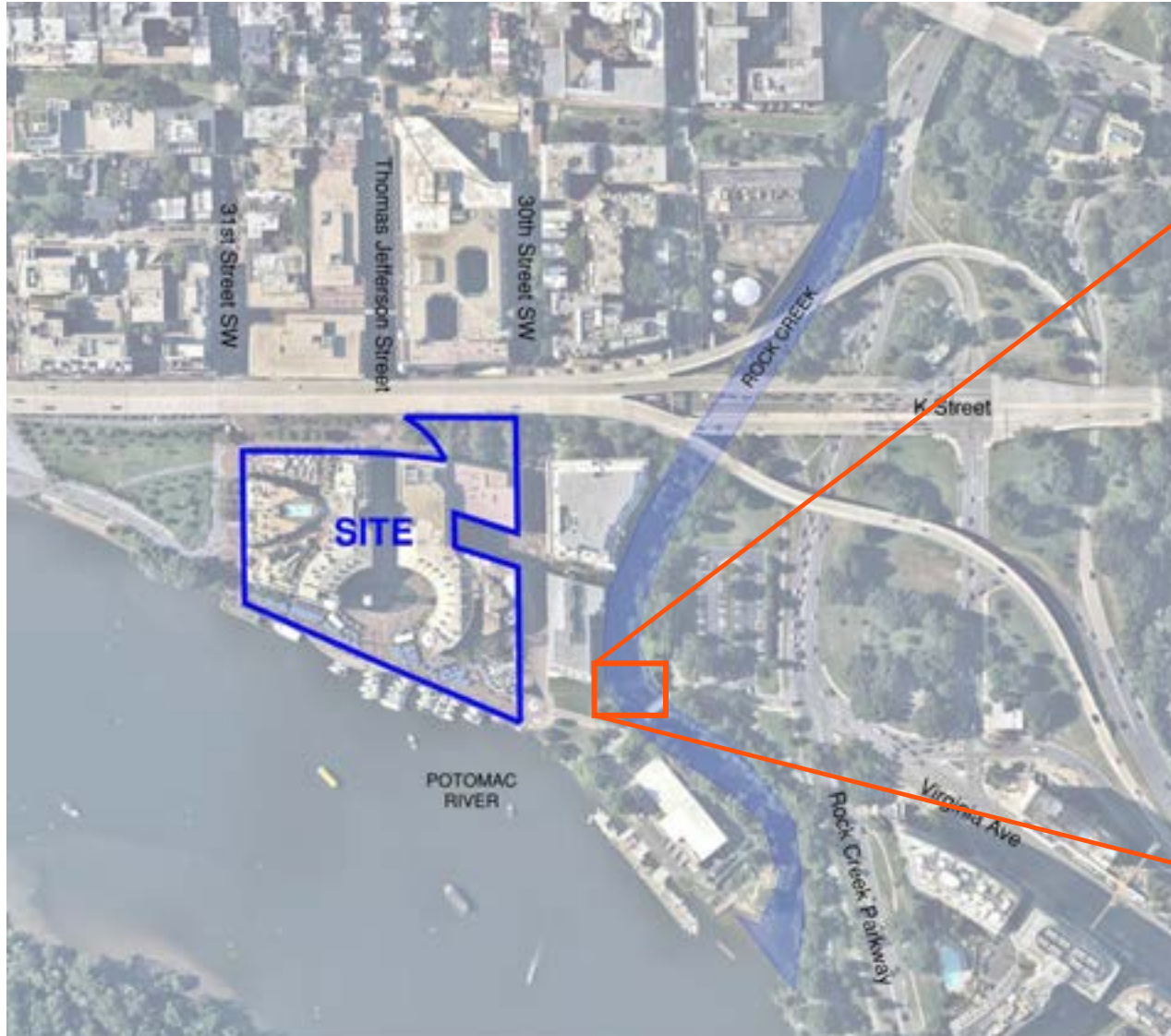
MAJOR OBSTRUCTIONS IN ROCK CREEK



- K Street Bridge

FLOOD STUDY

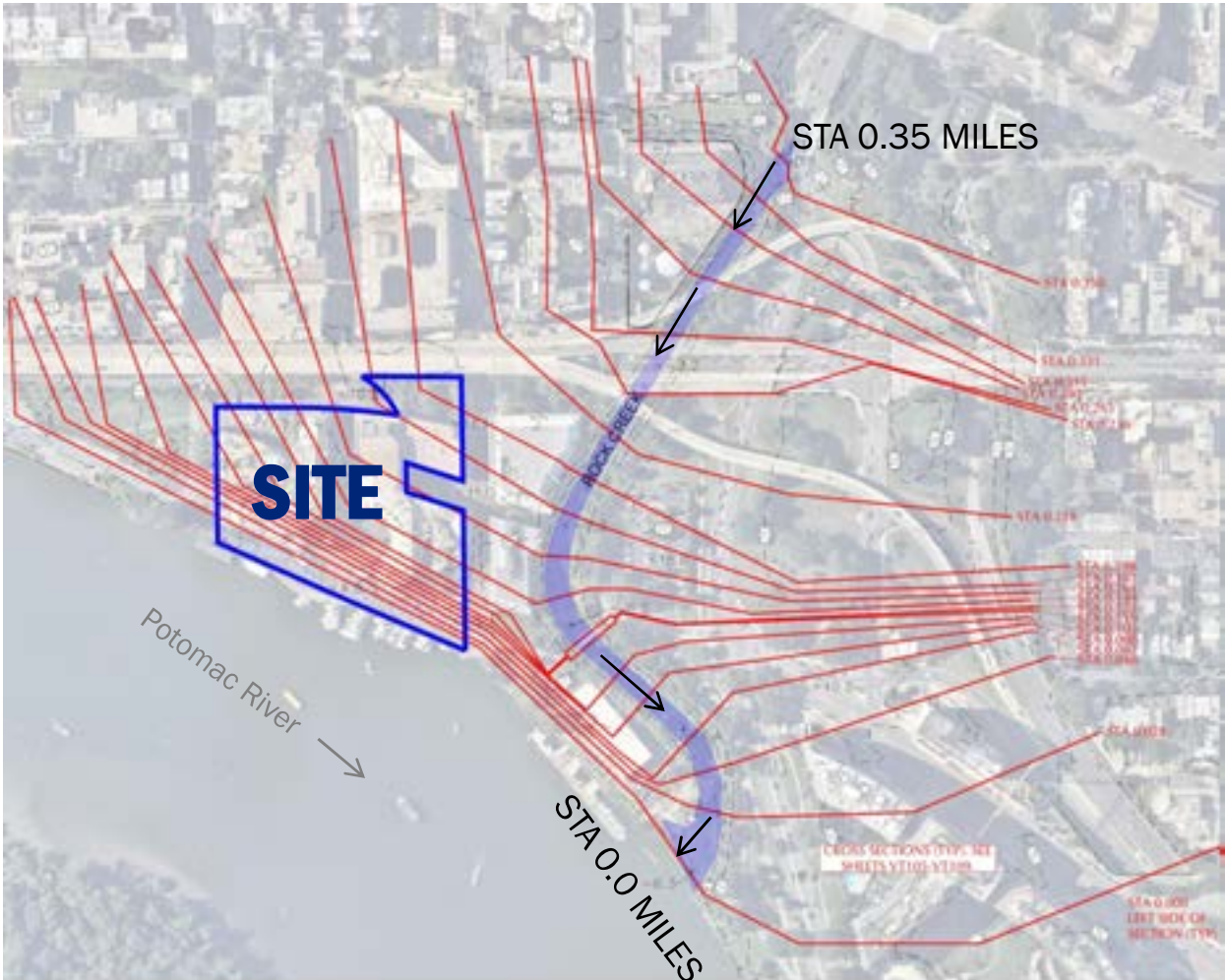
MAJOR OBSTRUCTIONS IN ROCK CREEK



- Rock Creek Channel and Pedestrian Bridge

FLOOD STUDY

SURVEY OF BATHYMETRY

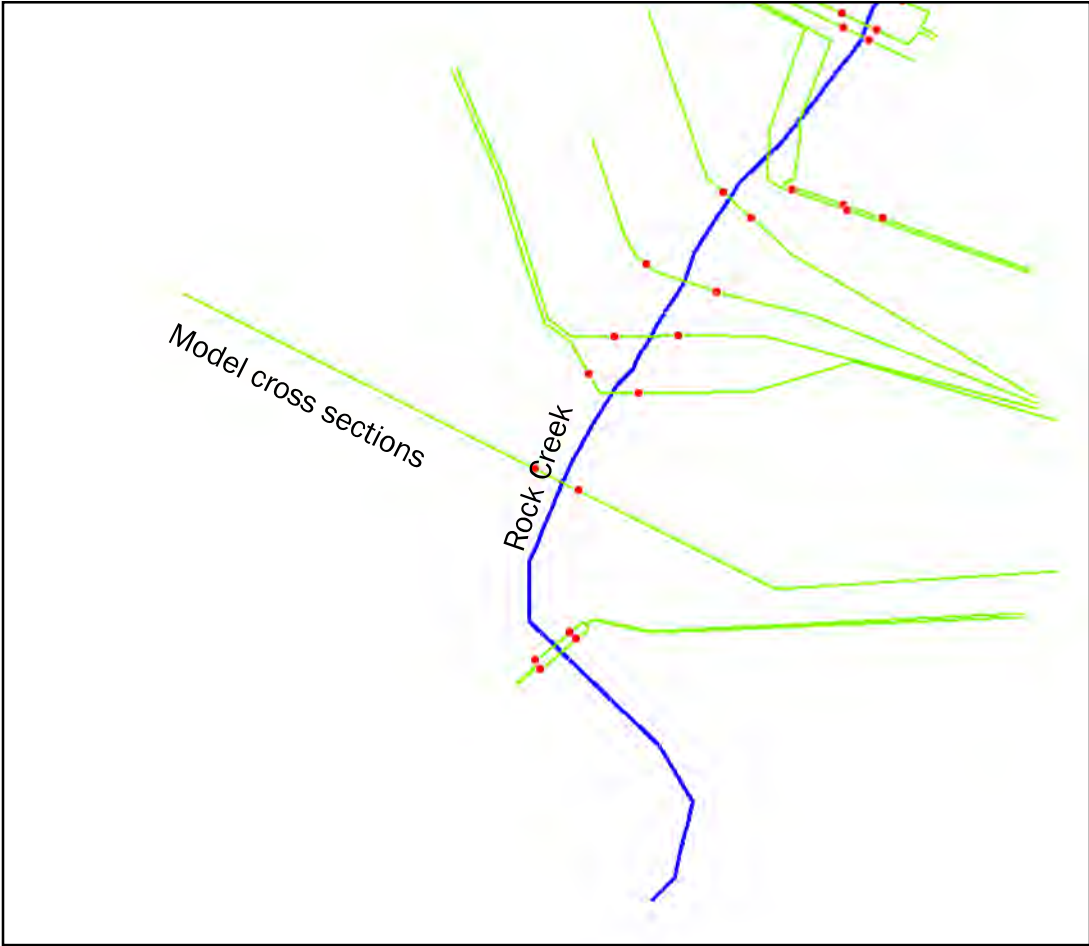


- Survey Bathymetry of Rock Creek

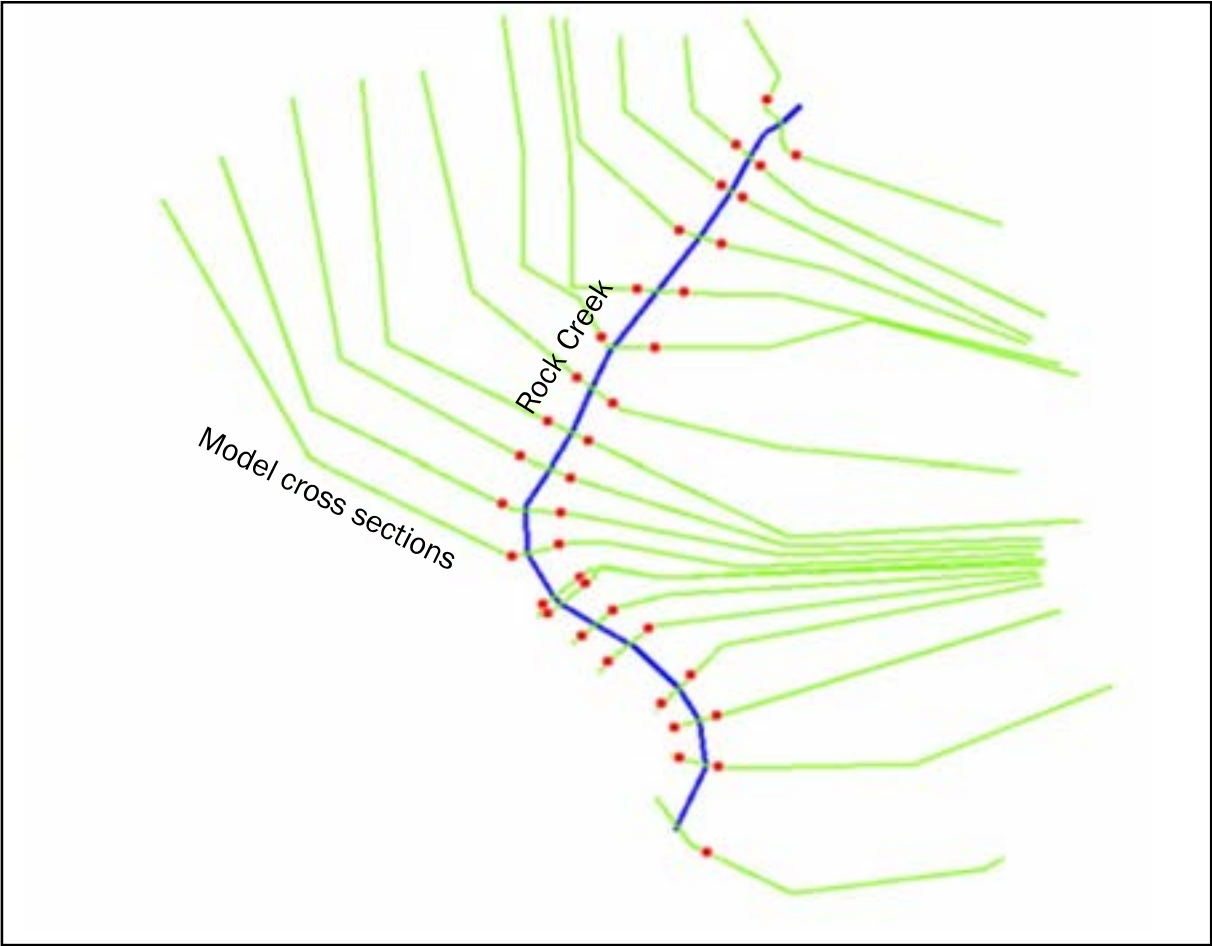


FLOOD STUDY

MODEL



Existing FEMA HECRAS sections



Updated HECRAS sections

FLOOD STUDY

MODEL

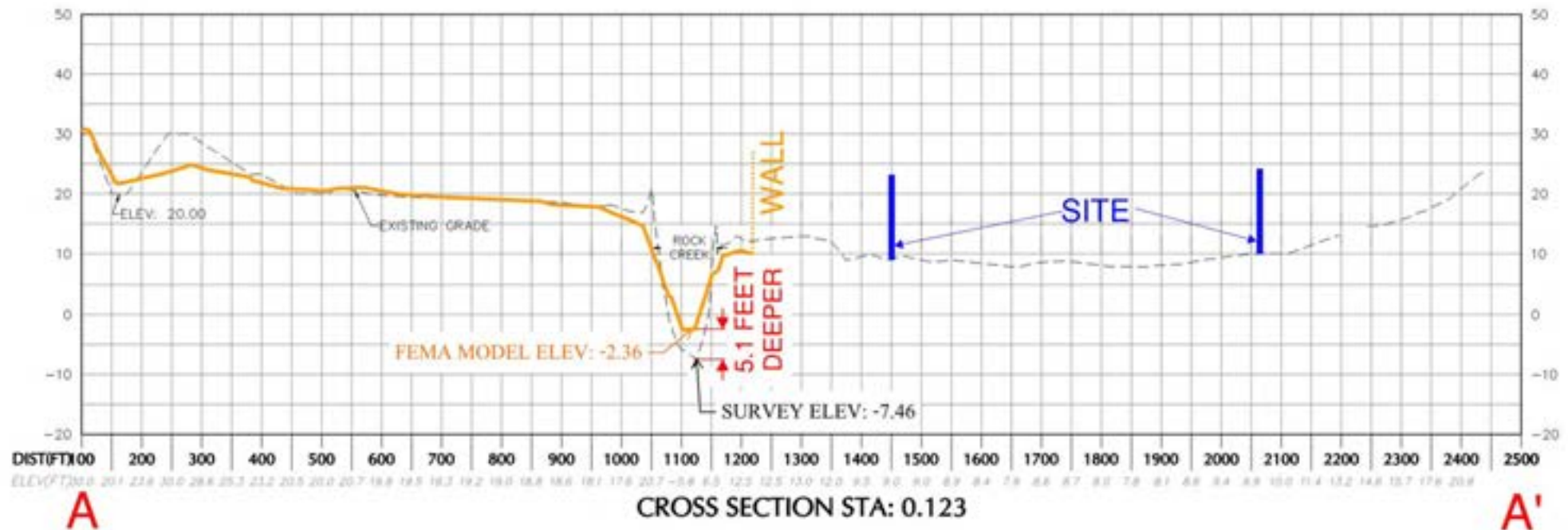


- 3D model and surface created of surveyed topography
- Cross sections cut through the 3D model and input into HECRAS

FLOOD STUDY

COMPARING BATHYMETRY- FEMA VS. NEW MODEL

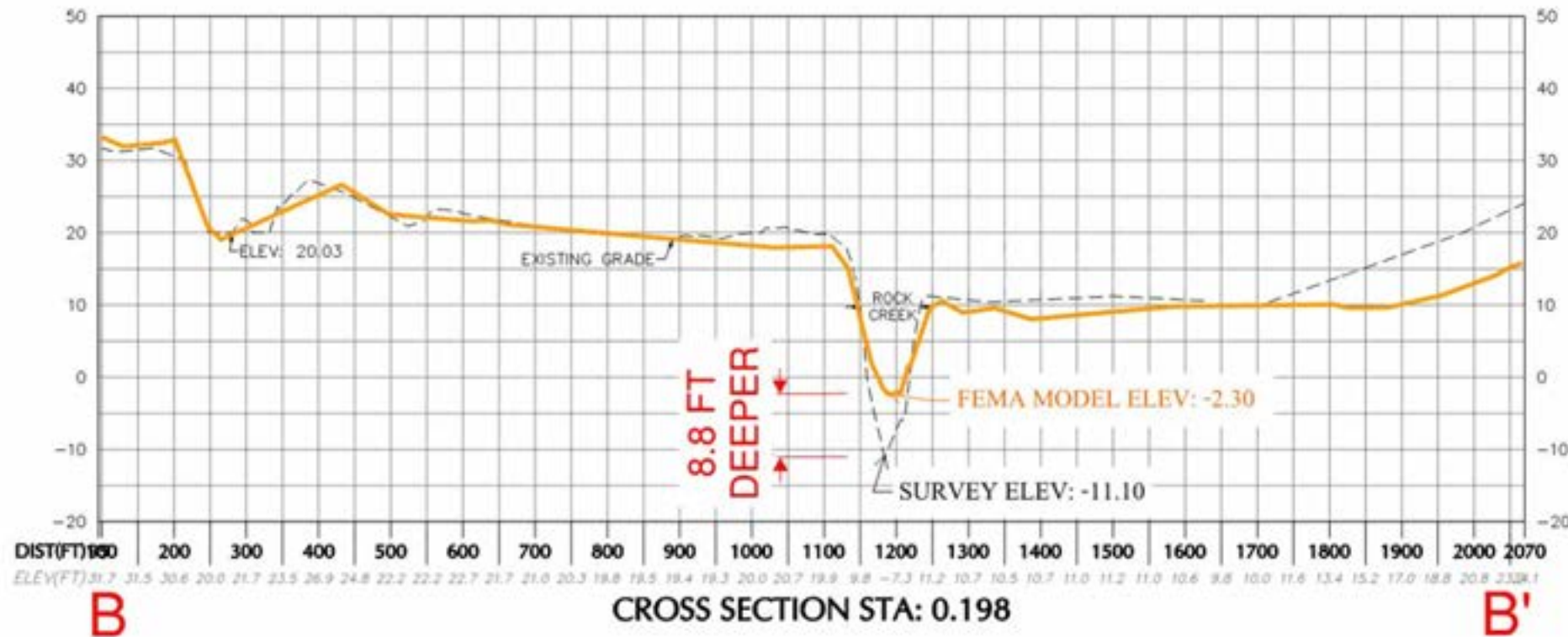
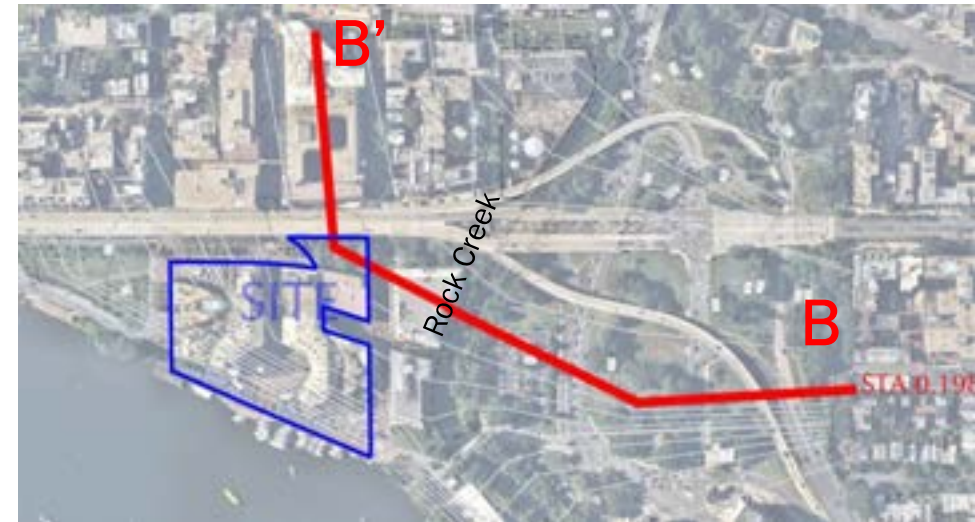
- Surveyed elevation of Rock Creek is 5.1 feet deeper than the FEMA flood model indicated
- FEMA section stops and is cut off, as a result a “wall” feature is added which in effect raises the flood elevation



FLOOD STUDY

COMPARING BATHYMETRY- FEMA VS. NEW MODEL

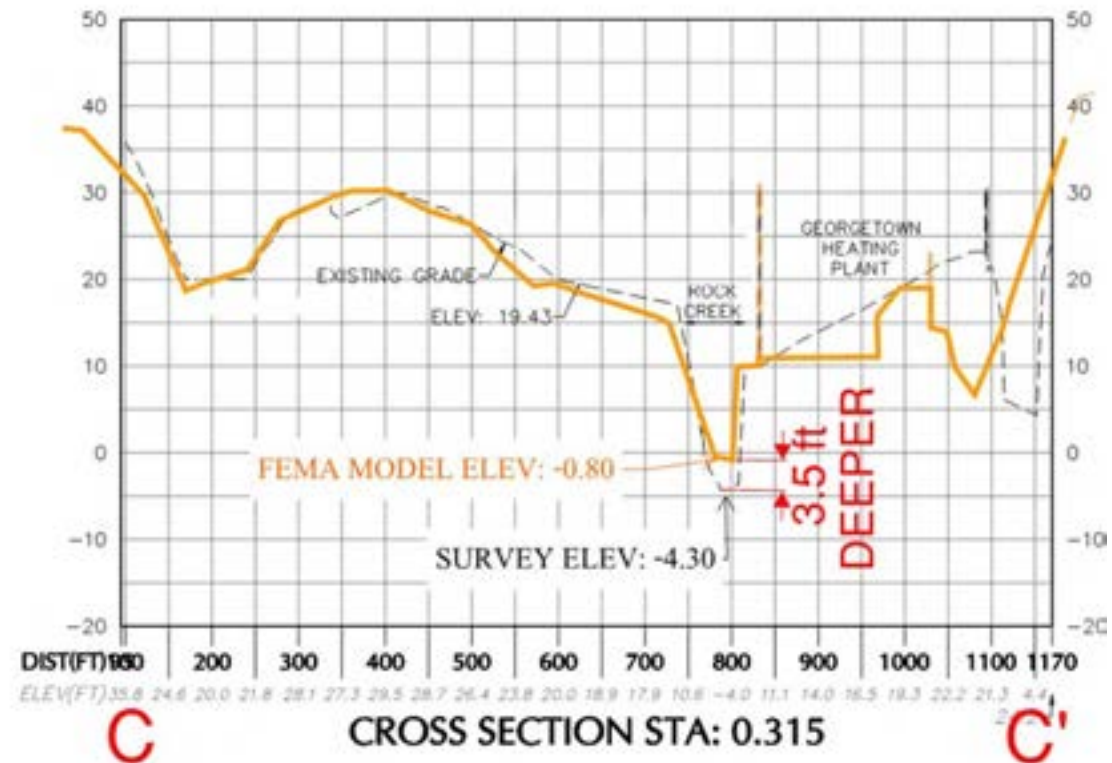
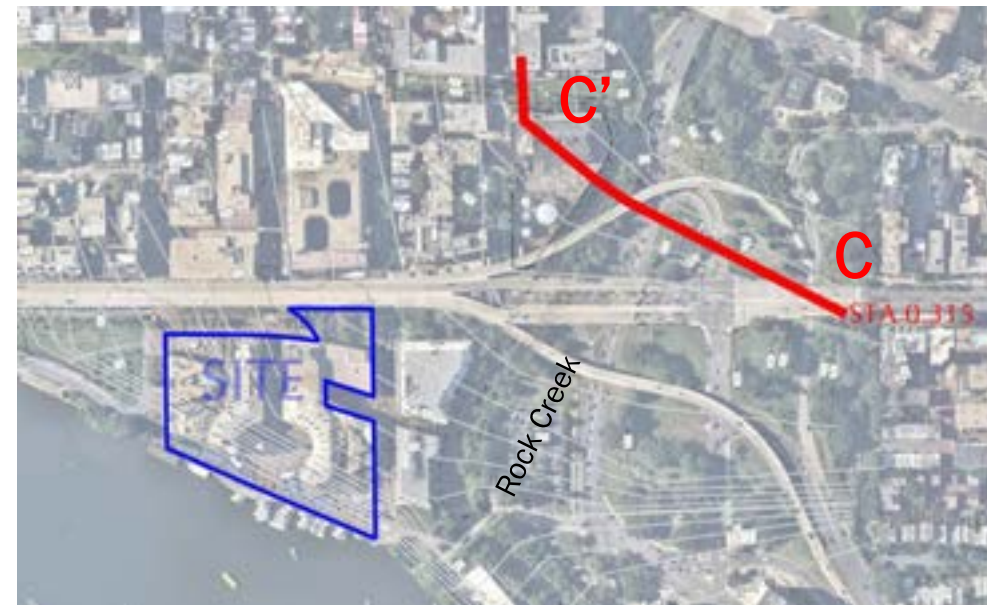
- Surveyed elevation of Rock Creek is **8.8 feet** deeper than the FEMA flood model indicated



FLOOD STUDY

COMPARING BATHYMETRY- FEMA VS. NEW MODEL

- Surveyed elevation of Rock Creek is 3.5 feet deeper than the FEMA flood model indicated



FLOOD STUDY

COMPARING FLOOD ELEVATIONS



Existing FEMA Flood Mapping



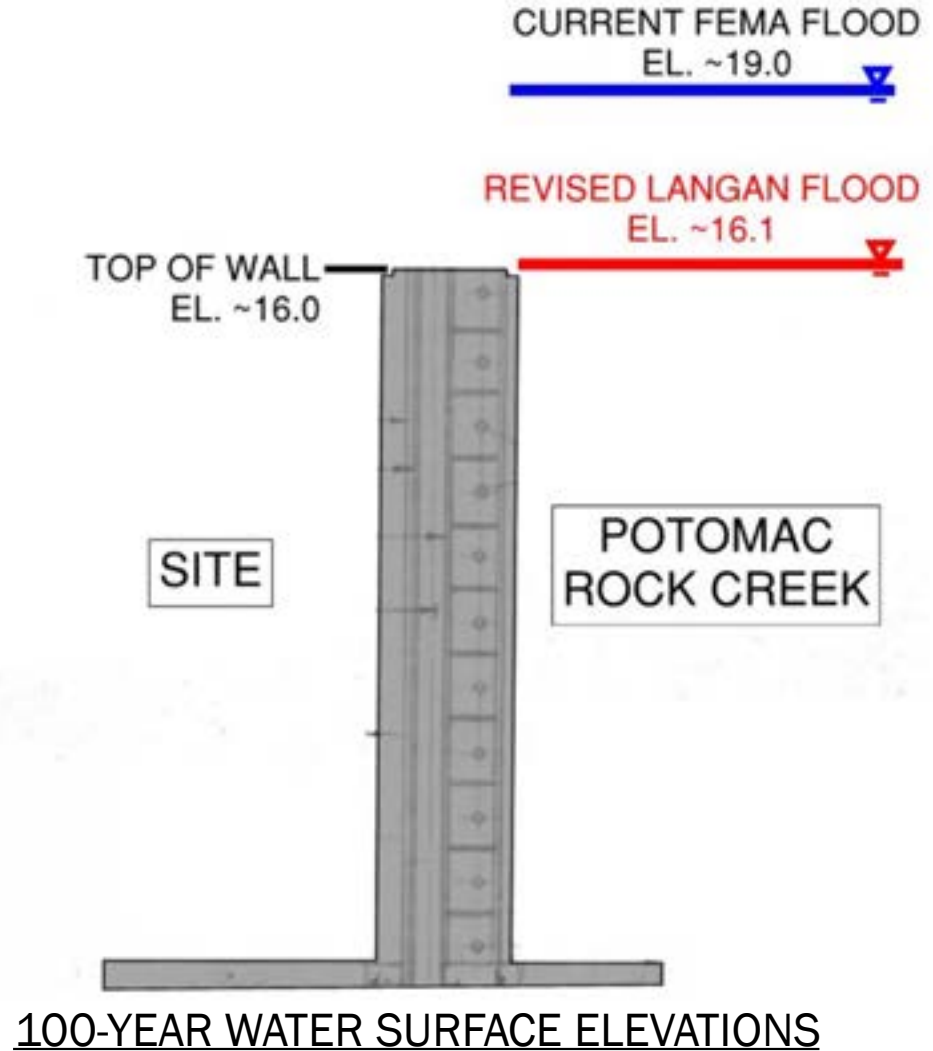
New Rock Creek Flood Mapping

- Rock Creek flood elevations lowered
- Peak flow in the Potomac occurs more slowly than in Rock Creek (~2 days vs 2 hours)

FLOOD STUDY

SUMMARY OF FINDINGS

- Flood elevations lowered ~3 feet at the site.
- Current FEMA model uses a survey conducted in the 1970's and is out-of-date.
- Actual bathymetry much deeper
- Current FEMA model has limited number and section extents

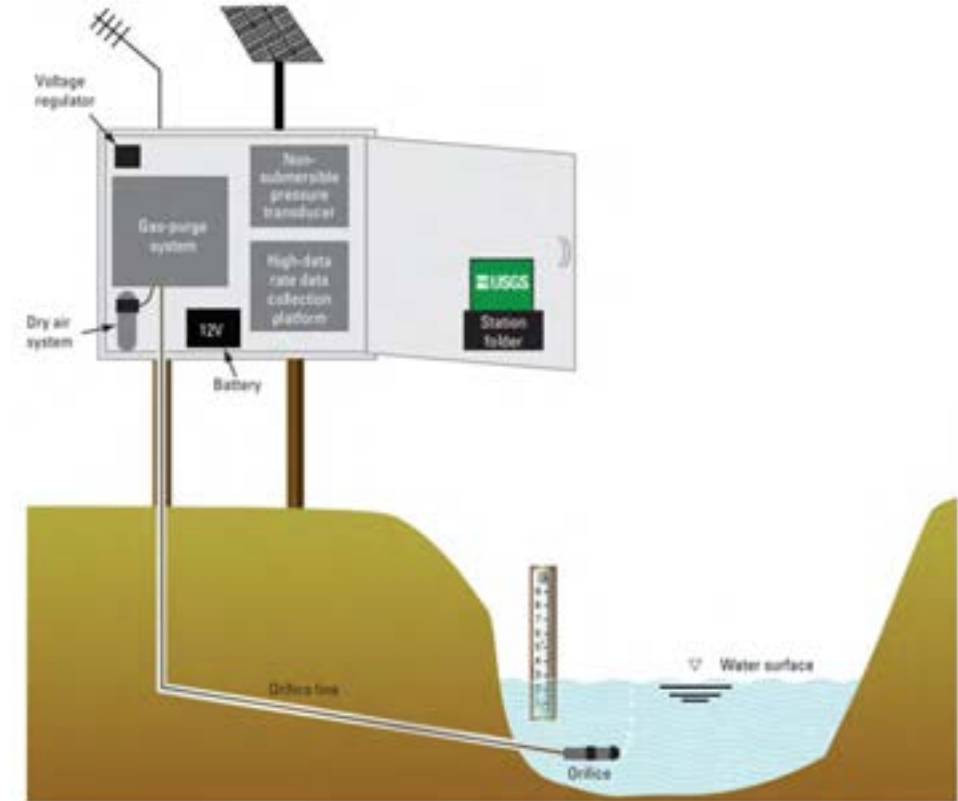


FLOOD STUDY

WATER LEVEL STATION

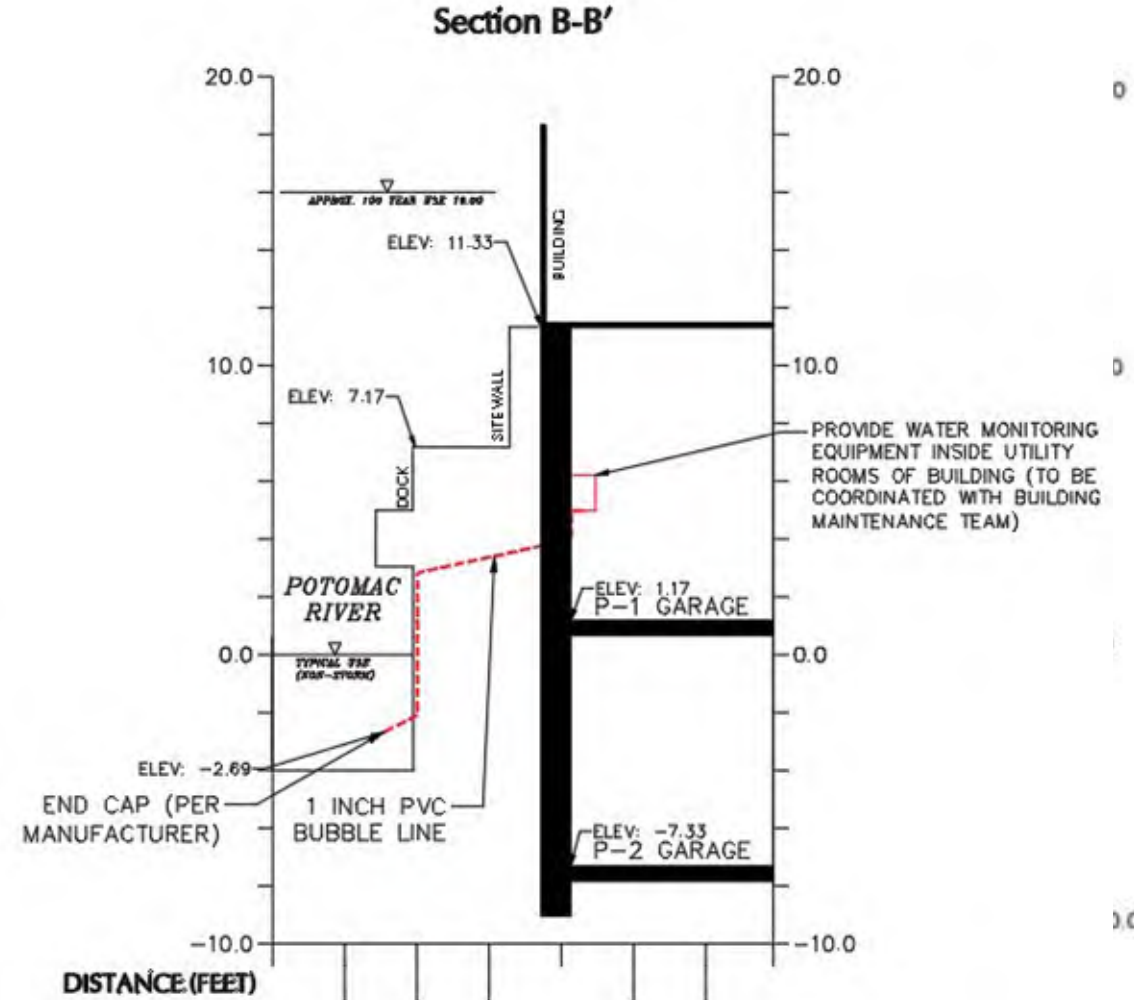
Two water level stations price estimate

- \$40k (materials) + \$15k (Langan Design+permitting) + \$5k permit fees + ~\$55k installation
= \$115k TOTAL



FLOOD STUDY

WATER LEVEL STATION



New Rock Creek Flood Mapping

- 2 total water level sensors
 - 1 on Potomac and 1 on Rock Creek

FLOOD STUDY

NEXT STEPS

Permits likely required for Water Level Sensors

- US Army Corps of Engineers – National Permit 5 Scientific Measurement Devices
 - No Preconstruction Notification required unless specifically requested
 - Conversations with Steve Harman at USACE
- National Parks Service approval
 - Conversations with the Rock Creek Park Chief Ranger Nick Bartolomeo. Likely a Right-of-Way permit will be required. Currently in the process of getting direction from NPS headquarters
 - Collected data will be shared with NPS

Next steps/timeline:

- DOEE/FEMA coordination to update LOMR ~ 18 months
- Water level sensor permitting/ construction ~8 months

BOARDWALK EDGE

RECOMMENDED ELEVATION: 6.36' – 6.9'

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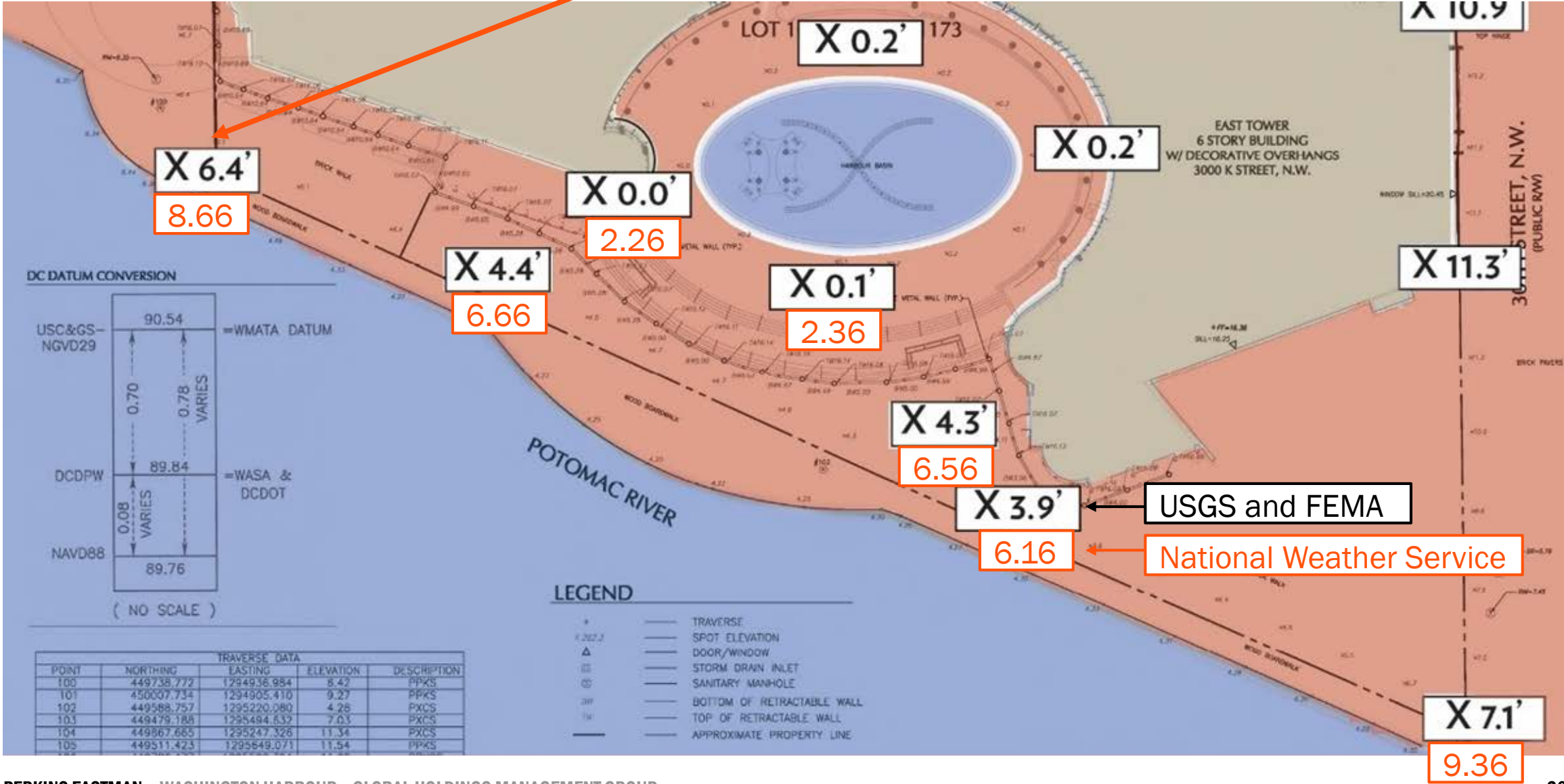
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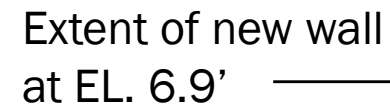
BOARDWALK EDGE

SURVEY ELEVATIONS

NO IMPACT TO EXISTING ELEVATIONS

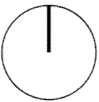
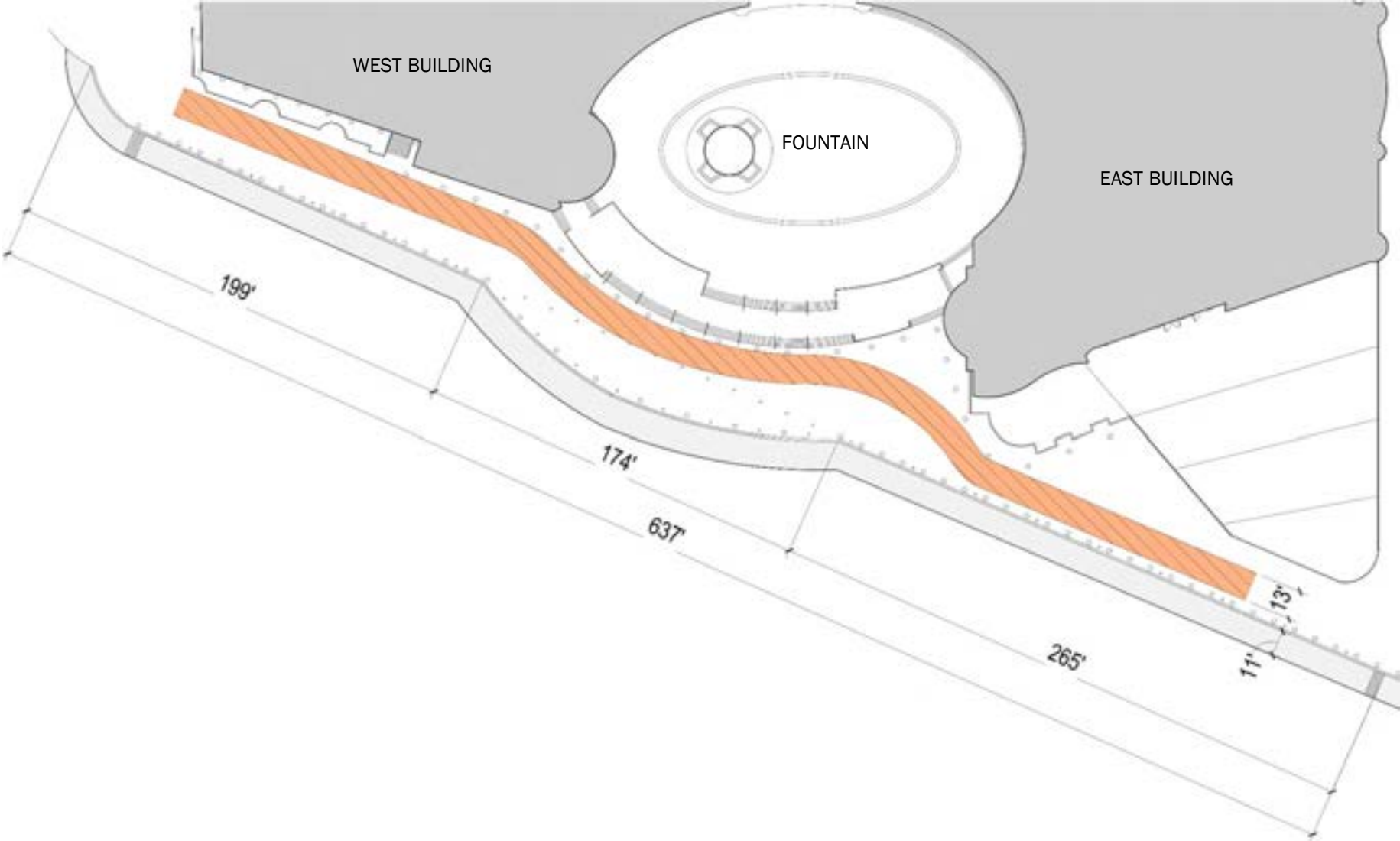


WALL ELEVATION: 3'-0"



BULKHEAD EDGE

EXISTING CONDITIONS & CONSTRAINTS



SITE ANALYSIS

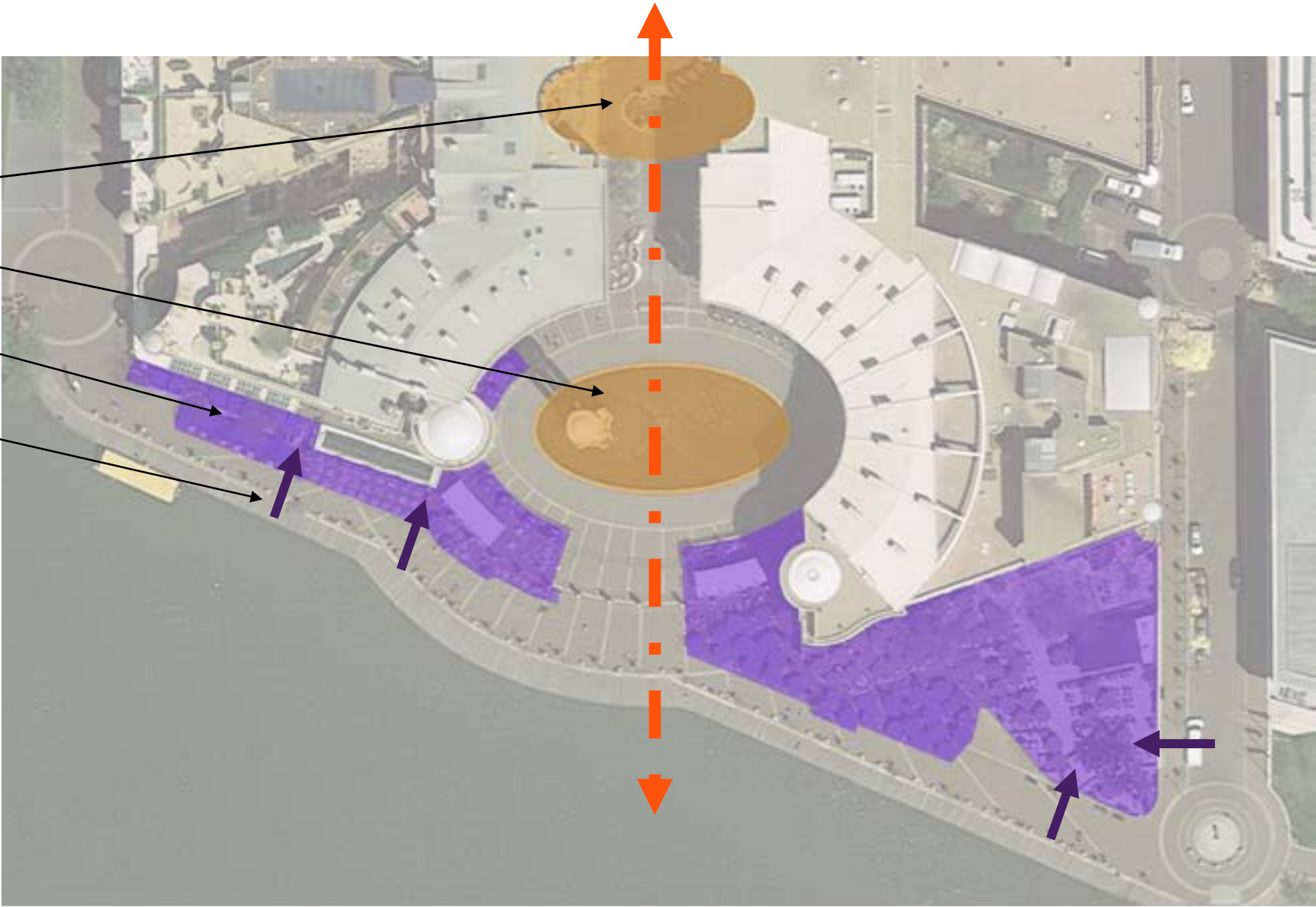
AREA OF INTEREST

UPPER FOUNTAIN

FOUNTAIN / ICE RINK

CAFÉ SEATING

CAFÉ SEATING
ENTRY POINT



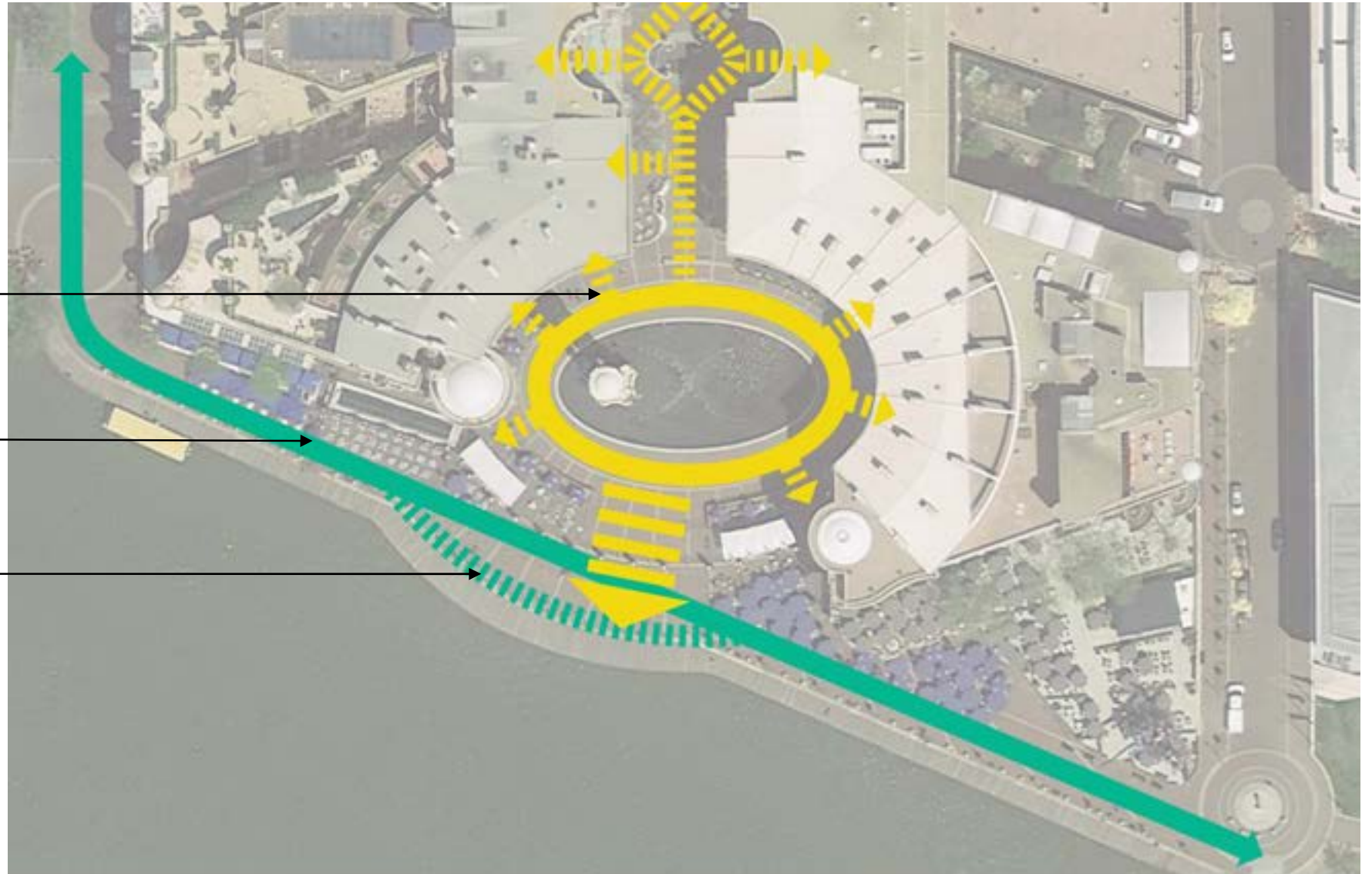
SITE ANALYSIS

TRAFFIC FLOW STUDY

INTERACTION WITH
RETAIL AROUND
FOUNTAIN

THROUGH
PEDESTRAIN TRAFFIC

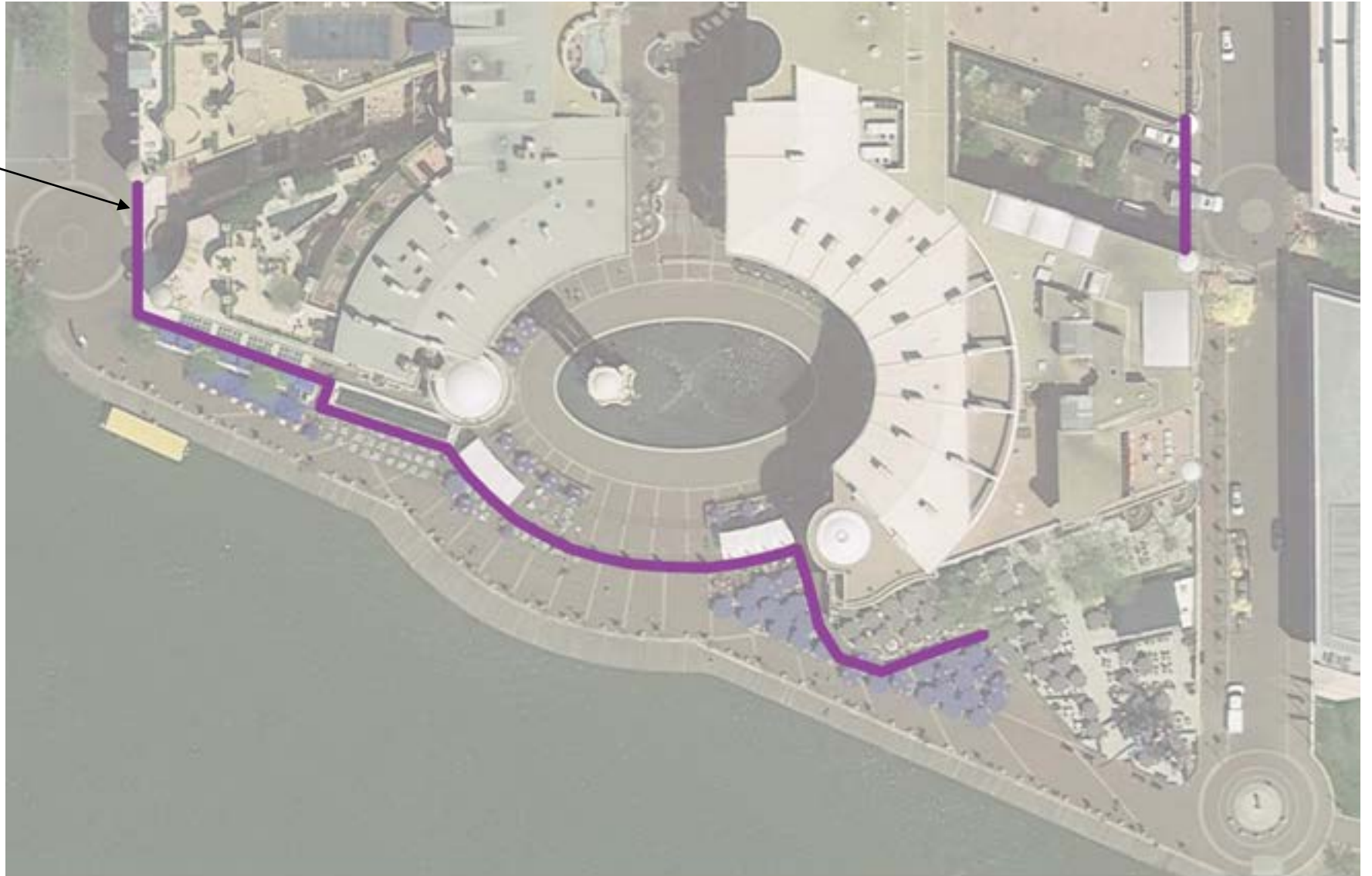
ENGAGING WATERFRONT



SITE ANALYSIS

INFRASTRUCTURE

EXISTING FLOOD
PROTECTION GATES



AREA LIMITATION

1,600 SF ON SITE

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